

Energy-Based Acoustic Measurement System for Rocket Noise, Phase II

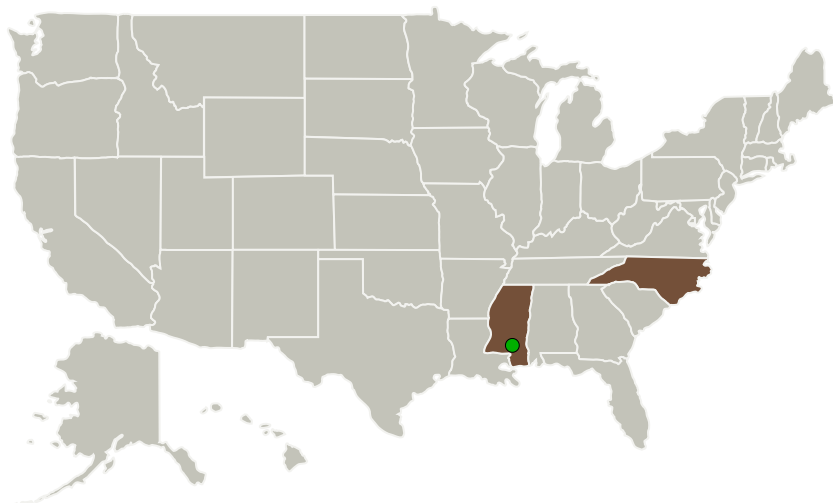
Completed Technology Project (2011 - 2013)



Project Introduction

Accurate estimates of the vibroacoustic loading placed on space vehicles and payloads during launch require knowledge of the rocket noise source properties. Given the extreme nature of acoustic environments near the plume, data sufficient to characterize the noise source region have been difficult to acquire. Without these data, structures may be designed to handle insufficient or excessive vibroacoustic loads, resulting in either an overbuilt structure (and extra weight), or an under-designed vibration isolation system that could result in damaged cargos. Current energy-based acoustic probe designs have limited frequency bandwidth due to physical limitations. A new set of probe designs is proposed that incorporate both a new physical probe design but also a more advanced signal processing methodology that will significantly increase the usable frequency bandwidth of the probes while reducing the manufacturing and maintenance costs of the probes. The probe system will also include the design of a complete data acquisition system capable of recording data under the harsh conditions present in typical rocket motor test firings.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Blue Ridge Research and Consulting	Lead Organization	Industry	Asheville, North Carolina
● Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi

Primary U.S. Work Locations	
Mississippi	North Carolina

Project Transitions

▶ **June 2011:** Project Start

✓ **August 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138980>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Blue Ridge Research and Consulting

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

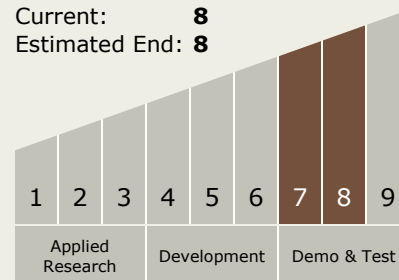
Michael M James

Technology Maturity (TRL)

Start: **7**

Current: **8**

Estimated End: **8**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.5 Structural Dynamics
 - └ TX12.5.2 Vibroacoustics

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System